The Scottish Clinical Simulation Centre has strong research links with the department of psychology at Aberdeen University. The industrial psychology group there has extensive experience of training in crew resource management in aviation and many other industries, including nuclear and offshore industries. Working in collaboration with this group, we have created a course for doctors, entitled crisis avoidance and resource management. The name highlights the emphasis that we place in the early part of the course on using the systems approach to identify and deal with latent errors.

Other aspects of the course address the issues of situation awareness, communication, leadership, decision making, and team working skills—the human factors that can help redress the balance of human error and mitigate the consequences of any errors that do occur. The course has been piloted on trainee anaesthetists, with overwhelmingly positive feedback, and is now integrated into the five year specialist registrar training programme in anaesthesia in Scotland.

Our centre is a national resource funded by the Scottish Council for Postgraduate Medical and Dental Education. We are now extending the availability of such training to all medical and dental trainees in Scotland—some 10% of trainees in the United Kingdom. It is important that everyone in medicine, and members of the public, are aware that the issue of medical error is being taken seriously in the United Kingdom and addressed in a positive manner.

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Different formulations of drugs often look confusingly similar

Editor—The Editor’s Choice of 3 March highlights the articles in that issue of the BMJ that discuss medical errors.1 Some common medical errors are routinely ignored despite frequent and serious adverse effects for the patient. Use of the antiepileptic carbamazepine is particularly problematic as the drug is often most effective when used at doses approaching the maximum tolerated, and a change from controlled release to standard formulation of the same tablet strength can precipitate intoxication.

Such inadvertent substitution of different formulations of carbamazepine is, in our experience, common in hospitals. It is also a problem in primary care. We recently solicited reports of problems with carbamazepine from readers of Epilepsy Today, the magazine of the British Epilepsy Association.2 We received 30 replies detailing episodes of overdosing and (less commonly) underdosing with carbamazepine, several with serious consequences to the patient. Sequelae included loss of control of diabetes, loss of driving licence, admission to hospital, and time off work.

Analysis of the errors showed that more than half were dispensing errors, some of which were attributable to the similarity of packaging between formulations of T egretol and T egretol. Some of the reported problems could have been avoided by education of the prescribing medical practitioner. Patients have become so used to the supply of generic equivalent drugs which differ subtly in size, shape, or colour from what they expect that they cannot recognise dispensing errors themselves.

Pharmaceutical companies should consider the possibility of confusion between different formulations of a drug when designing packaging, and be aware that the brand image can be at the expense of patient safety.

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Appropriate training should avoid accidental intrathecal injection of vincristine

Editor—Various suggestions have been made about how systems of work, packaging, and labelling of drugs and equipment could be improved to decrease the risk of accidental intrathecal injection of vincristine.1 Most of the suggestions that have merit if adopted as part of a multifactorial approach would undoubtedly help to reduce risk. Two points, however, deserve vigorous challenge.

The first is the suggested use of negative labelling on vincristine syringes or, indeed, any other drugs. Despite knowing that the Medicines Control Agency take a different view, we believe this is fundamentally wrong and as likely to cause an accident as prevent one. In the case of vincristine or any other vinca alkaloid, the safest label is one that clearly states “for intravenous use only” and on which the word intrathecal does not appear at all. To include phrases such as “not for intrathecal injection” or “fatal if given intrathecally” is courting disaster. It may create a subliminal association between the name of the drug and the routes of administration listed. Fail to read the word “not” in the first phrase or to note more than intrathecal in the second and yet another almost certain death is imminent. Furthermore, where should the list of prohibited routes of administration stop? An accidental intramuscular dose of vincalkaloid may not be fatal but nevertheless causes serious harm.

Our second concern is that none of the measures suggested for improving case of identification of otherwise similarly presented drugs mentions the single most critical variable that must be addressed as part of the safety equation: the absolute necessity of reading the label. We fully accept that, despite the prolonged and enthusiastic efforts of hospital pharmacists over many years, standards of manufacturers’ labelling often leave much to be desired. Yes, of course, small print and similar or nearly identical packaging designs make the chance of confusion greater. There can only ever, however, be one genuinely unique identifier of the contents of a medicine package of any sort: the drug name. The central focus of our efforts must be to make sure that the approved name is as prominent and legible as possible. We should do nothing to detract from this and everything we can to facilitate it.

As far as haemato-oncology practice is concerned, there is one thought which should now give us some confidence. No appropriately trained doctor who has actually read vincristine on the label (which in this case is unlikely to be the manufacturer’s but one generated locally by the hospital pharmacy) is likely to inject the contents intrathecally into his or her patient.

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On behalf of the British Oncology Pharmacy Association (Denise Blake, chair, and Max Summerhayes, Alison Conway, Libby Hardy, Mary McLean, committee members).


Dosage nomenclature of bleomycin needs to be standardised to avoid errors

Editor—The consequences of errors involving anticancer drugs can be devastating. As correctly detailed by Seale, errors arise not only from inadequate time and training and supervision of medical staff but also from poorly written or ambiguous protocols.1 Such ambiguity is associated with the dosage nomenclature for bleomycin. Published protocols give bleomycin doses in milligrams (mg), international units (IU), or United States Pharmacopoeia units (USP units). This inconsistency in nomenclature seems to be universal and can lead to incorrect interpretation of medical literature.

Historically, bleomycin dosage has been described in terms of milligram potency (mg potency), in which 1 mg potency corresponds to 1 unit. In the original preparations 1 mg potency was also equivalent to 1 mg by weight (mg weight). Modifications and improvements in purification over time have meant that ampoules labelled as containing 15 mg—that is, 15 units—contained less than 15 mg weight of bleomycin.2

In 1995 labelling of bleomycin products in Australia changed from USP units to IU in line with changes in the British Pharmacopoeia and European Pharmacopoeia. The 10 mg vial, formerly labelled as containing 15 USP units, is now labelled as containing 15 000 IU. This

1 Editor’s choice. Medical error: creeping from words to action. BMJ 2001;322:7285. (3 March.)

1 Alberti KGMM. Medical errors: a common problem. BMJ 2001;322:563. (3 March.)
Chemotherapy regimens have been formalised into protocols in British Columbia

Editor—Cancer chemotherapy is a discipline in which the risks of error need to be minimised. Treatment regimens are often complex, involve very toxic agents, and require special precautions in preparation and administration to protect the health workers. In British Columbia we have formalised many chemotherapy regimens into protocols to ensure that adequate and appropriate information is readily accessible by those prescribing, preparing, and administering chemotherapy.

Each protocol is a concise but accurate summary of the treatment regimen and follows a standard format. Each has a unique protocol code (indicating tumour site and drugs used), eligibility and exclusion criteria for the treatment, baseline and ongoing clinical and laboratory tests, treatment regimen, dose modifications, premedications, precautions, the name and telephone number of the doctor responsible for the protocol, and provision data.

Each protocol is reviewed by an oncology doctor, pharmacist, and nurse for the adequacy, appropriateness, and potential misinterpretation of the information. To enable easy access, the protocols are available on our local area network and internet website (www.bccancer.bc.ca). To date, we have developed over 160 protocols, covering 13 major tumour groups and supportive care.

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1 Editor’s choice: Medical error: creeping from words to action. BMJ 2001;322:7285. (3 March.)

Medical schools can teach safe drug prescribing and administration

Editor—The medical world has been slow to realise the importance of drug errors as a cause of morbidity and mortality. The numerous instances in England where doctors have injected vincristine intrathecally, not intravenously, underline this.1 Woods has now produced a report on intrathecal medication errors for the United Kingdom Department of Health.2 It recommends that medical schools should ensure that their core curricula provide a thorough knowledge of safe drug prescribing and administration and that there should be proper assessment. We strongly endorse these recommendations.

In Birmingham we have for several years helped final-year medical students learn practical therapeutics by interactive teaching based on clinical problems. We examine students’ knowledge after a course of “therapeutics roadshows” by multiple choice questions. In addition, we and a clinical pharmacist lecture aspiring house officers on the sorts of errors in prescribing and giving medicines that are commonly encountered.

Students who are expected to transmute overnight into doctors often lack practical preparation. Teahon and Bateman found that many house officers felt unprepared to give intravenous treatment, and many admitted to making errors.3 Unfamiliarity greatly increases the chances of error.4 Nearly two years ago we introduced an objective structured clinical examination in therapeutics to test rudimentary skills, in addition to the test of knowledge. Part of the examination presents clinical vignettes of conditions such as myocardial infarction, asthma, and severe pain and asks students, for example, to write a suitable prescription or submit an adverse drug reaction report. Some questions have required the administration of drugs by intravenous injection, nebuliser, or an automatic injector (as used at cardiac arrests). Others have asked students to give specific practical advice to a patient receiving, say, sublingual glyceryl trinitrate for angina or an inhaler for asthma.

In addition to small group teaching on writing prescriptions and giving intravenous injections, students are encouraged during their final medical attachments to write prescriptions to be countersigned by trained medical staff and to take a practical part in the administration of drugs. We suspect that our students are now better equipped to cope with the demands of practical therapeutics as house officers: the average percentage score in a test of reconstituting and administering an intravenous injection has risen steadily from 48% in 1999 to 72% in 2001.

A practical test of simple therapeutic skills such as writing prescriptions and giving injections ensures a minimal level of competence in junior doctors. Although changes to the systems of prescribing and giving drugs will also be needed, better practical training and assessment may help to protect patients from the tragic consequences of drug errors.

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1 Dyer C. Government to introduce safer administration of cancer drugs after fatal error. BMJ 2001;322:1013. (28 April)


Medical profession must take drug errors seriously

Editor—Errors relating to drug treatments are common and can arise from various sources. Ferner considered a selection of mistakes and slips that led to fatal outcomes,1 but the vast majority of errors are less serious and may therefore remain undetected.

Correct patient identification and clear written prescriptions are important components of the safe administration of drugs in hospital. Few studies, however, have considered how frequently these basic requirements are adequately met. I performed an observational audit in a busy district general hospital in Essex, looking at all of the drug charts in the hospital on one defined day to ascertain whether the basic requirements for safe prescription had been fulfilled. Altogether I examined 317 (85%) of the drug charts in the hospital. A medication error was noted if the relevant information was missing, unclear, illegible, or incorrect. Only 51 of the charts were completely correctly filled in. The number of correctly